## REMARKS

This application now contains claims 1 and 3 through 24. Claims 1 and 15 have been amended. Claim 2 has been cancelled. Claim 1 has been amended to include the molecular weight limitation previously set forth in claim 2. The amendment to claim 15 is presented to correct a typographical error.

The invention is directed to the discovery that a narrow class of high molecular weight dispersants that are the reaction product of a polyalkenyl-substituted mono- or dicarboxylic acid, anhydride or ester; and a polyamine, provide an unexpected improvement in lubricating oils. Specifically, it has been found that high molecular weight dispersants having a functionality within the limited range of greater than 1.3 to less than 1.7, and a molecular weight distribution (of the polyalkenyl moiety) within the limited range of 1.5 to 2.0, provide lubricating oil compositions with improved piston cleaning properties.

Claims 1 and 3 through 24 stand rejected under 35 USC Section 103(a) as being unpatentable over U.S. Patent No. 4,863,624 to Emert et al. (hereinafter "the Emert et al. patent"). The Emert et al. patent is directed to a mixture of a first, high molecular weight (1500 to 5000), low functionality dispersant (1.05 to 1.25), and a second, low molecular weight (700 to 1150), moderate functionality (1.2 to 2.0) dispersant. Claim 1 has been amended to include the molecular weight limitation previously described in claim 2. All remaining claims depend, either directly or indirectly, from claim 1. Therefore, the withdrawal of the rejection presented under Section 103 in view of the Emert et al. patent is respectfully requested.

Claims 1 through 24 stand rejected under 35 USC Section 103(a) as being unpatentable over U.S. Patent No. 4,234,435 to Meinhardt et al. (hereinafter "the Meinhardt et al. patent"). The Meinhardt et al. patent discloses generally materials that are the reaction product of a polyalkenyl-substituted mono- or dicarboxylic acid, anhydride or ester; and a polyamine, and that such materials are useful as dispersants for use in lubricating oil. The Meinhardt et al. patent describes broadly the functionality of the dispersants, requiring only that said functionality be at least 1.3. Similarly, the Meinhardt et al. patent describes broadly the molecular weight distribution of the polyalkenyl moiety, describing said molecular weight distribution as being from 1.5 to 4.5. The Meinhardt et al. patent fails to suggest that those specific high molecular weight materials having simultaneously a functionality within the limited range of greater than

1.3 to less than 1.7, and a molecular weight distribution within the narrow range of 1.5 to 2.0 will provide any significant benefit over similar dispersants outside the scope of the present claims.

The benefits of the presently claimed dispersants, compared directly to other dispersants within the broad class of materials disclosed by the Meinhardt et al. patent, are clearly demonstrated by the comparative test results of the present specification, as summarized in Table 2 (page 34). As shown by the data of the specification, particularly by a comparison of Oils 1 to 4, raising the functionality of a dispersant (which one would do to achieve higher dispersant nitrogen content, and thus, increased sludge/varnish and soot control) results in a deterioration in the piston cleanliness result (indicated in terms of PC Merit G2 @ 36 hrs. and hrs. to $PC_{av} = 65$).

A comparison between Oils 1-3, containing dispersants D1 to D3, respectively, and Oils 5 and 6, containing dispersants D5 and D6, respectively, demonstrates the effect of the molecular weight distribution of the polyalkenyl precursor on the piston cleanliness performance. Specifically, Oil 4, which contains dispersant D4 representing the present invention, provides dramatically improved piston cleanliness performance compared to Oil 3, which contains a dispersant (D3) having an identical functionality (1.4) and a molecular weight distribution greater than 2.0). In fact, Oil 3 provides improved piston cleanliness compared to Oils 1 and 2, which contain lower functionality dispersants. Even Oil D6 of the invention, which contains a dispersant having a functionality of 1.6, outperformed the comparative oils in terms of piston cleanliness, including Oil 1, which contains dispersant D1 having a functionality of only 1.0.

The criticality of the claimed upper limit on functionality is clearly seen by comparing inventive Oils 5 and 6 to comparative Oil 4, which contains dispersant D4 having a molecular weight distribution within the claimed range (about 2), and a functionality greater than 1.7 (1.8). This comparison clearly establishes that a slight increase in dispersant functionality over the claimed upper limit results in a dramatic reduction in piston cleanliness performance, even when the high functionality dispersant meets the molecular weight distribution limitation of the present claims.

There is nothing in the Meinhardt et al. patent that would lead one of ordinary skill in the art to expect a relationship between dispersant functionality, the molecular weight distribution of the dispersant precursor, and piston cleanliness performance in oil. There is nothing in the Meinhardt et al. patent that would lead one of ordinary skill to select the present narrow class of

claimed dispersants from the broader class, for any purpose. The unexpectedly improved performance provided by dispersants within the narrow selected class now claimed is clearly demonstrated by the test data of the specification. In view of this demonstration of unexpectedly improved results, applicants submit that the rejection presented under Section 103 in view of the Meinhardt et al. patent, now be withdrawn.

Based upon the foregoing, applicants submit that the claims of this application distinguish over each of the cited prior art references. Therefore, applicants respectfully request that all rejections be withdrawn, and that the above-identified application now be passed to issue.

Respectfully submitted,

Jacob M. Levine
Attorney for Applicants
Registration No. 32,509

Infineum, USA, L.P.
1900 East Linden Avenue
P.O. Box 710
Linden, NJ 07036
(908) 474-2418